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HEREDITY IN STOCK BREEDING.

By I. D. Graham, Topeka, Kan.

MY purpose in this paper is not to call attention to any fact that is new to science, nor to any new discoveries along scientific lines. The aim is rather to direct brief attention to the practical application in a commercial way of certain well-established scientific laws. The scientist is too often credited with being a dreamer and his work is frequently looked down upon by his fellow man who delights to style himself "practical." In spite of the attitude assumed by the self-styled "practical man," the fact remains that a vast deal of the material prosperity to which he has attained is due directly to the previous work done by the scientist in his study of nature's laws.

None has been better established among the laws of nature than that "like produces like." Nothing is better established than the added fact that the law of variation is just as well founded. In applying these laws to his own purposes, the breeder of pure-bred live stock has done so, not because of the value which his work might prove to science, but because he saw the only means by which he could attain the object of his labors and supply the demands of his market.

With the emergence of our race from barbarism began the taming and the ultimate improvement of the wild animals of forest and plain. With his increase in intelligence and his daily handling of the animals which he had tamed to his own uses, earlier man came to notice that certain types were more valuable to him for certain purposes, and that the mating of animals of similar type increased or strengthened these valuable points in the progeny. Of course, it is understood that these facts only came to be realized after ages of handling the animals. The development of knowledge along this line was gradual, but it was found to be real knowledge and to have a financial value. Upon this, and accompanied by the increased demands of our civilization, has grown up the business of stock breeding which is now one of our largest industries and which rests for its success upon the knowledge and practical application of the laws before mentioned.

The oldest breed of pure-bred live stock, the Shorthorn cattle, which is so important in the commercial life of to-day, is but little more than one hundred years of age. Beginning with the wild cattle with which he was surrounded, the breeder, by selection and proper mating, has developed the wonderful special-purpose types which we have to-day. The observer who looks at the 600-pound cow of the cattle range, and compares her with the 2400-pound cow of the show ring, can see at a glance the wonderful advance that has been made in the development of beef animals, though he may not understand how it has been accomplished nor the time required for the development of this pride of the American breeder. Nor is the average observer aware of the fact that the great beef animals and the splendidly-developed dairy cattle are not only the results of a judicial control of the laws of heredity, but the animals on exhibition are select specimens taken from among those of their kind which have required a century to produce.

I am firmly convinced that the breeder who produces the great beef animals or the special-purpose dairy animals that are now so common at our exhibitions is worthy of great credit. In fact, he has been termed an artist who is just as much entitled to a niche in the temple of fame as is the man who produces a great painting or he who creates a musical masterpiece. He certainly is entitled to credit, and the animals obtained by his labors are due to his careful observance of the laws of heredity and his careful selection of types whose union will produce what he needs.

The cattle-breeder of to-day finds that his market demands animals of a certain size with extra or perhaps abnormal development in certain parts. As no two animals are exactly alike and as no one is perfect, it becomes his duty to select animals for mating purposes each of which is the complement of the other. For instance, the part known as the loin in a beef animal contains the highest-priced cuts of meat, and it is the ambition of the breeder to produce an animal that will have the largest amount of fleshy deposit in this region. In doing this he must not only select animals which are strong in this feature, but those which will possess other valuable qualities as well. Both parent animals must be of large vitality. They must be of the type known as "easy feeders," and this necessitates large abdominal regions with great digestive powers. Their vitality is indicated by large heart girth and great "spring of rib." Coupled with these must be the bright eyes which at once indicate health and intelligence, because these are two of the important foundation stones upon which he must build.

If the breeder finds that he has a cow that is practically perfect in all respects save one quality, he mates this animal with one that is exceptionally strong in that quality and by this process of natural selection he ultimately produces the wonders of the bovine world which record his triumph over his ancestors and over the law of variation which constantly tends to undo his work.

I have in my office a picture of a cow whose maternal qualities have been developed to such an extent that her product of milk and butter has reached an abnormal point, and she is credited with a little over 1000 pounds of butter in one year. I have also the portrait of a hog that is so near perfection and so desirable a type of herd header that he recently sold for more than $5000 and proved a good investment to the purchaser. I have numerous portraits of beef breeds of cattle which have been so developed through selection and breeding that they produce the "baby beef" so much in demand at present and for which such ready sale is found. Formerly it was true that our beef animals had to be fed, or at least grown, to three or four years old before they were in marketable condition. Now eighteen months is about the limit. Our official statistics for the year 1907 show that the total value of live stock in Kansas was $197,250,857, and from this one fact alone, to which we may add the other fact that Kansas is rapidly becoming one of the best-known pure-bred states in the Union, it will be seen that a knowledge of heredity in stock breeding is of vast importance to our people. It is estimated that eighty per cent. of the pure-bred Hereford cattle of the United States are to be found in the territory of which Kansas City is the center. Facts show that other breeds are equally well represented in this region, while northern Kansas and southern Nebraska have become one of the greatest swine-breeding sections of the entire country, and this in spite of the fact that the corn belt was supposed to be the only home of the hog and that its western limits had long been passed by the settlers of that country.

Within the writer's knowledge there is no scientific fact the application of which to the affairs of daily life has brought more direct or valuable results than those of heredity in live-stock breeding.